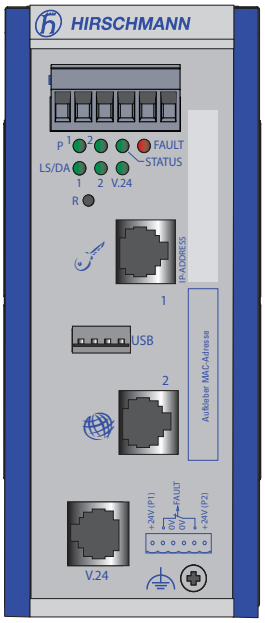
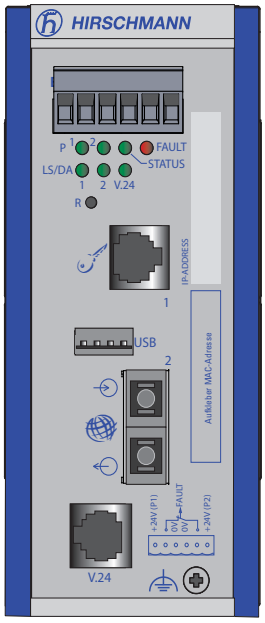
HIRSCHMANN
A BELDEN BRAND

User Manual

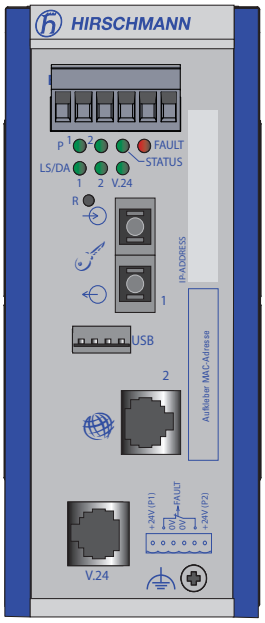
Installation
Industrial ETHERNET Firewall
EAGLE 20



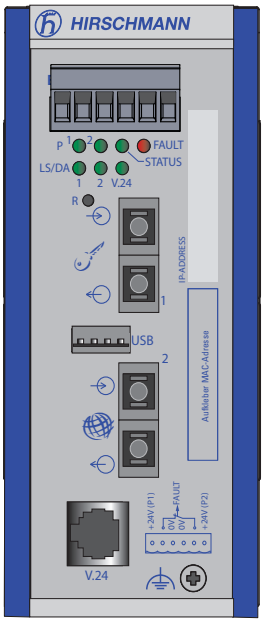
EAGLE 20 TX/TX



EAGLE 20 TX/MM
EAGLE 20 TX/SM



EAGLE 20 MM/TX



EAGLE 20 MM/MM

039715001010908000

EAGLE 20
Release 09/08

Technical support
HAC-Support@hirschmann.de

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Printed in Germany
Hirschmann Automation and Control GmbH
Stuttgarter Str. 45-51
72654 Neckartenzlingen
Germany
Tel.: +49 1805 141538

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Safety instructions

This documentation contains instructions which must be observed to ensure your own personal safety and to avoid damage to devices and machinery.

Certified usage

Please observe the following: The device may only be employed for the purposes described in the catalog and technical description, and only in conjunction with external devices and components recommended or approved by the manufacturer. The product can only be operated correctly and safely if it is transported, stored, installed and assembled properly and correctly. Furthermore, it must be operated and serviced carefully.

Password security note

This device is a security-relevant product. For your own security, change the password during the first startup procedure.

Supply voltage

The devices are designed for operation with a safety extra-low voltage.Thus, they may only be connected to the supply voltage connections and to the signal contact with SELV circuits with the voltage restrictions in accordance with IEC/EN 60950-1.The supply voltage is electrically isolated from the housing.
The supply voltage is electrically isolated from the housing.

- ☐ Use only undamaged parts!
- ☐ Relevant for North America:
  The subject unit is to be suppplied by a Class 2 power source complying with the requirements of the National Electrical Code, table 11(b). If power is redundant supplied (two individual power sources) the power sources together should comply with the requirements of the National Electrical Code, table 11 (b).
- ☐ Relevant for North America:
  Use 60/75°C or 75°C copper(CU)wire only.

Shielding ground

The shielding ground of the connectable twisted pairs lines is connected to the front panel as a conductor.

- ☐ Beware of possible short circuits when connecting a cable section with conductive shielding braiding.

Housing

Only technicians authorized by Hirschmann are permitted to open the housing.
The lower panel of the device is grounded by means of the hat rail and optionally by means of the separate ground screw.

- ☐ Make sure that the electrical installation meets local or nationally applicable safety regulations.
- ☐ The ventilation slits must not be covered so as to ensure free air circulation.
- ☐ The clearance to the ventilation slits of the housing must be at least 10 cm.
- ☐ Never insert pointed objects (thin screwdrivers, wires, etc.) into the inside of the subrack! Failure to observe this point may result in injuries caused by electric shocks.
- ☐ The device must be installed in the vertical position (see fig. 8).
- ☐ If installed in a living area or office environment, the device must be operated exclusively in switch cabinets with fire protection characteristics according to EN 60950-1.

Environment

The device may only be operated at the specified maximum ambient temperature and relative air humidity (non-condensing).

- ☐ Install the device in a location where the climatic threshold values specified in the technical data are adhered to.
- ☐ Only to be used in an environment with the contamination level specified in the technical data.

Qualification requirements for personnel

Qualified personnel as understood in this manual and the warning signs, are persons who are familiar with the setup, assembly, startup, and operation of this product and are appropriately qualified for their job. This includes, for example, those persons who have been:

- ▶ trained or directed or authorized to switch on and off, to ground and to label power circuits and devices or systems in accordance with current safety engineering standards;
- ▶ trained or directed in the care and use of appropriate safety equipment in accordance with the current standards of safety engineering;
- ▶ trained in providing first aid.

General safety instructions

This device is electrically operated. Adhere strictly to the safety requirements relating to voltages applied to the device as described in the operating instructions!

Non-observance of these safety instructions can therefore cause material damage and/or serious injuries.

- ☐ Only appropriately qualified personnel should work on this device or in its vicinity. These personnel must be thoroughly familiar with all the warnings and maintenance procedures in accordance with this operating manual.
- ☐ The proper and safe operation of this device depends on proper handling during transport, proper storage and assembly, and conscientious operation and maintenance procedures.
- ☐ Never start operation with damaged components!
- ☐ Only use the devices in accordance with this manual. In particular, observe all warnings and safety-related information.
- ☐ Any work that may be required on the electrical installation may only be carried out by personnel trained for this purpose.

Warning!
LED- or LASER components according to IEC 60825-1 (2001):
CLASS 1 LASER PRODUCT.
LIGHT EMITTING DIODE - CLASS 1 LED PRODUCT.

National and international safety regulations

- ☐ Make sure that the electrical installation meets local or nationally applicable safety regulations.

Note on the CE marking

The devices comply with the regulations contained in the following European directives:

2004/108/EG
Directive of the European Parliament and the Council for standardizing the regulations of member states on electromagnetic compatibility.
In accordance with the above-named EU directives, the EU conformity declaration will be at the disposal of the relevant authorities at the following address:

Hirschmann Automation and Control GmbH
Stuttgarter Str. 45-51
72654 Neckartenzlingen
Tel.: +49 1805 141538

The product can be used in living areas (living area, place of business, small business) and in industrial areas.

- ▶ Interference immunity: EN 61000-6-2:2005
- ▶ Emitted interference: EN 55022:2006 Class A

Warning!
This is a class A device. This device can cause interference in living areas, and in this case the operator may be required to take appropriate measures.
The assembly guidelines provided in these instructions must be strictly adhered to in order to observe the EMC value limits.

FCC note:

Appropriate testing has established that this device fulfills the requirements of a class A digital device in line with part 15 of the FCC regulations.
These requirements are designed to provide sufficient protection against interference when the device is being used in a business environment.
The device creates and uses high frequencies and can radiate same, and if it is not installed and used in accordance with this operating manual, it can cause radio transmission interference. The use of this device in a living area can also cause interference, and in this case the user is obliged to cover the costs of removing the interference.

Recycling note

After usage, this product must be disposed of properly as electronic waste in accordance with the current disposal regulations of your county / state / country.

About this manual

The following manuals are available as PDF files on the CD-ROM supplied:

- “Installation” user manual
- “Configuration” user manual
- “Web-based Interface” reference manual and
- “Command Line Interface” reference manual

Legend

The commendations used in this manual have the following meanings:

▶	Listing
☐	Work step
■	Subheading

1 Device description

The industrial Firewall/VPN system
- EAGLE 20 TX/TX
- EAGLE 20 TX/MM
- EAGLE 20 TX/SM
- EAGLE 20 MM/TX
- EAGLE 20 MM/MM

subsequently known as EAGLE 20, ensures the authentication, security and confidentiality of communication within production networks, but also beyond company boundaries.

The EAGLE 20 has the following interfaces:
- depending on the type, up to two 10/100 Mbit/s twisted pair (TP/TX) ports (RJ45 socket) and/or
- depending on the type, up to two 100 Mbit/s FX ports (multimode or singlemode) with DSC connections and
- additionally a V.24 input for external management or a modem connection and
- a USB interface.

The EAGLE 20 supports the following network modes:
- Transparent Mode
- Router Mode

The Industrial ETHERNET Firewall is used everywhere that security-sensitive network cells require a connection out from the cell in a harsh environment. The Industrial ETHERNET Firewall is the link between the “secure” network cells and the “unsecured outside world”. In its function as a link, the Industrial ETHERNET Firewall protects the security-sensitive cell from undesired data traffic along the connection to the outside world.

Typical uses are:

- Protecting individual production cells in a flat company network.
- Protecting individual production cells in a routed company network.
- Coupling identical production cells to a company network.
- Connecting a production cell with the office network via a public network.
- Providing protected service access.

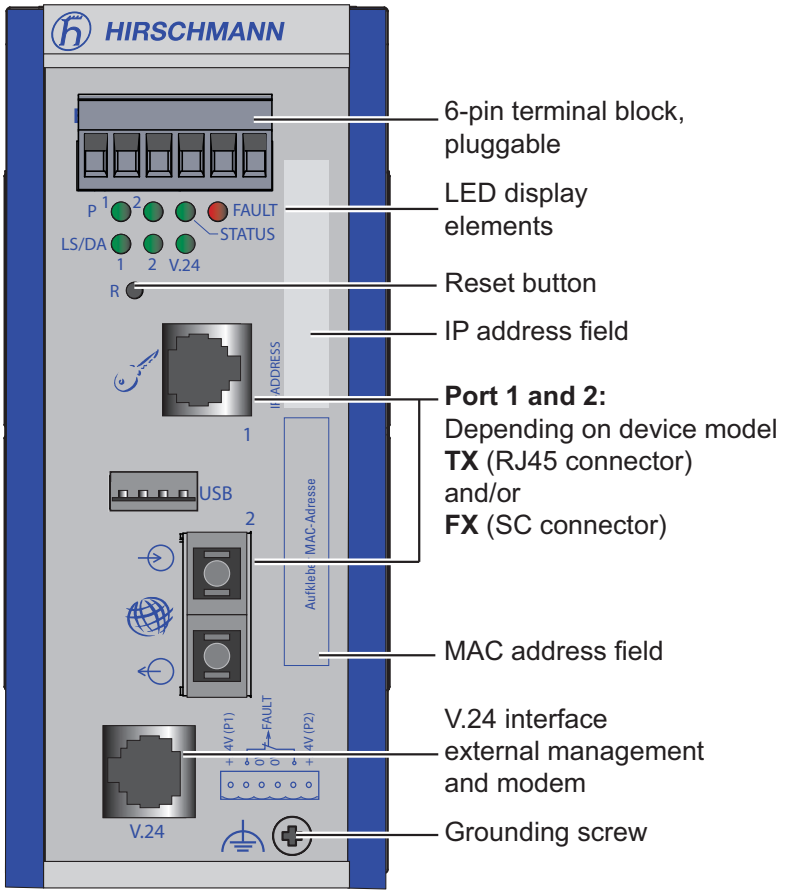


Figure 1: Overview of interfaces, display and operating elements on the EAGLE 20

The devices are designed for the special requirements of industrial automation. They meet the relevant industry standards, provide very high operational reliability, even under extreme conditions, and also long-term reliability and flexibility. The devices operate without fans and have a redundant voltage supply. The devices are very quickly mounted by snapping them onto a hat rail, which also automatically contacts the function ground.

The devices provide you with a large range of features:

- Firewall (FW)
- Virtual Private Network (VPN) functions
- ARP Limiter
- Redundancy support
- ACA 21-USB support
- Management: HTTPS, SNMPv1, SNMPv2, SNMPv3, SSH
- Redundant power supply
- Temperature range: 0°C – 60°C, without fan
- Housing: mountable on hat rail, IP20

The addition, to the EAGLE 20 family, of the MICE and RS20/RS30/RS40 open rail family switches, the MACH family of backbone switches, the ruggedized switch family for substation MACH 1000, the BAT wireless transmission system, and products for the MACH control room,
ensures continuous communication across all levels of the company.

1.1 Description of the device variants

These devices can be managed. They have the following properties:

- Voltage range: 18 to 32 VDC
- Temperature range: 0°C to +60 °C
- Certifications / declarations: CE, cUL508

The device conforms to the specifications of standard

- ISO/IEC 8802-3u 100BASE-TX
- ISO/IEC 8802-3 100BASE-FX

The device contains all the function units, such as: Firewall/VPN function, Management function, voltage connection, management connection, operation element.

Interfaces

	Port 1 (trusted)			Port 2 (untrusted)		
	TX	MM		TX	MM	SM
EAGLE 20 TX/TX	x			x		
EAGLE 20 TX/MM	x				x	
EAGLE 20 TX/SM	x					x
EAGLE 20 MM/TX		x		x		
EAGLE 20 MM/MM		x			x	

TX = Twisted pair 100BASE-TX
MM = F/O multimode 100BASE-FX
SM = F/O singlemode 100BASE-FX

1.1.1 Device variants with 2 TX ports

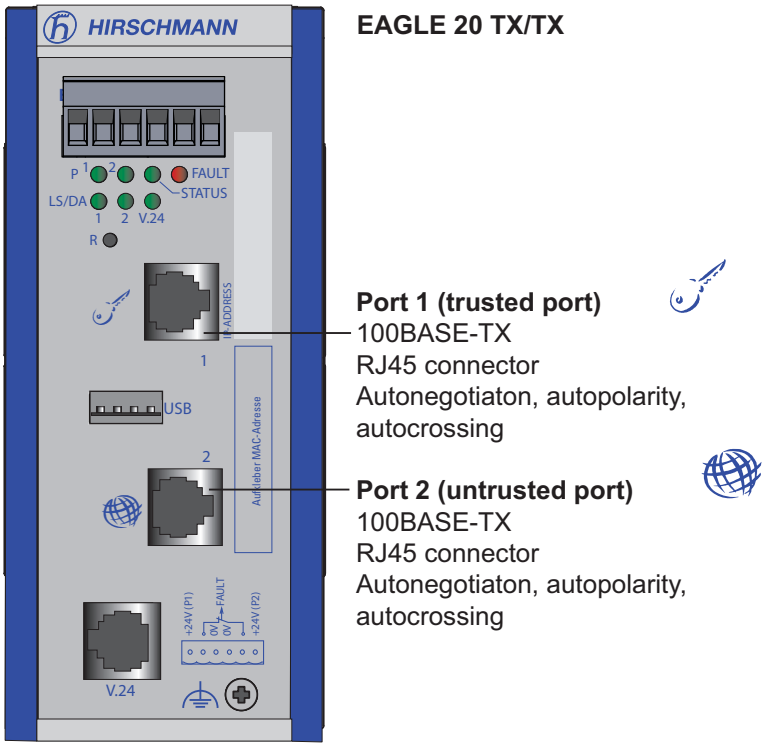


Figure 2: Interfaces of the EAGLE 20 TX/TX

1.1.2 Device variants with 1 TX port and 1 FX port

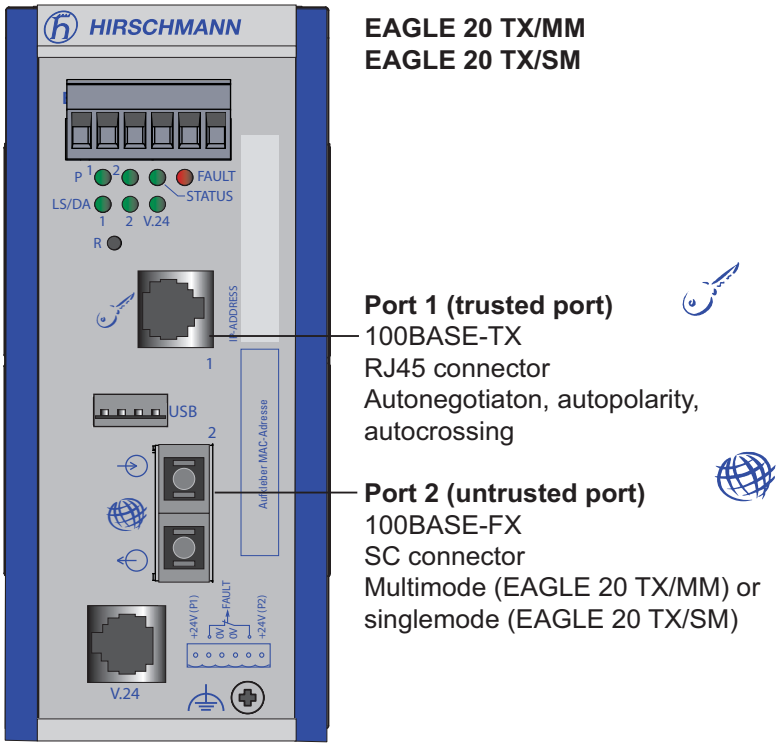


Figure 3: Interfaces of the EAGLE 20 TX/MM and EAGLE 20 TX/SM

1.1.3 Device variants with 1 FX port and 1 TX port

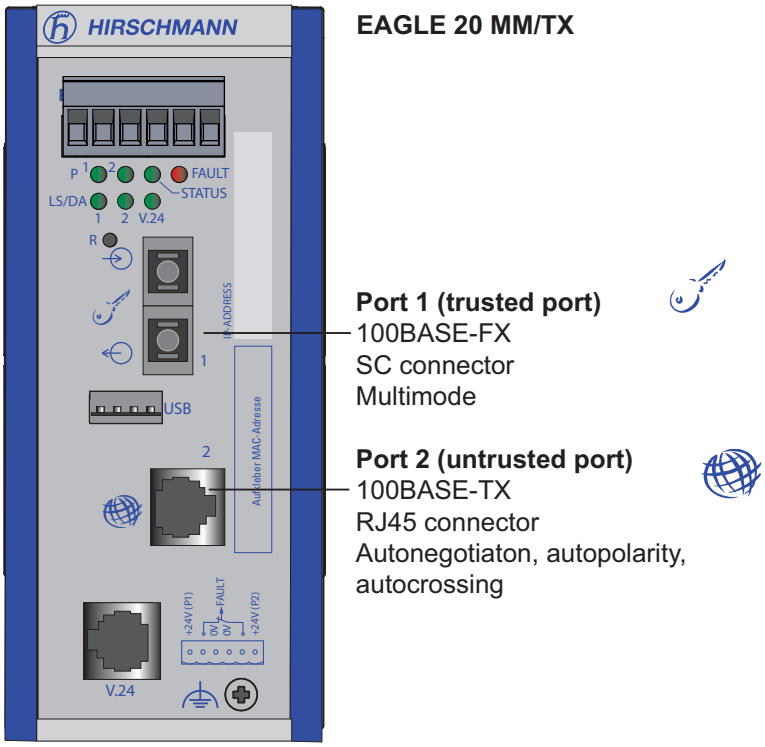


Figure 4: Interfaces of the EAGLE 20 MM/TX

1.1.4 Device variants with 2 FX ports

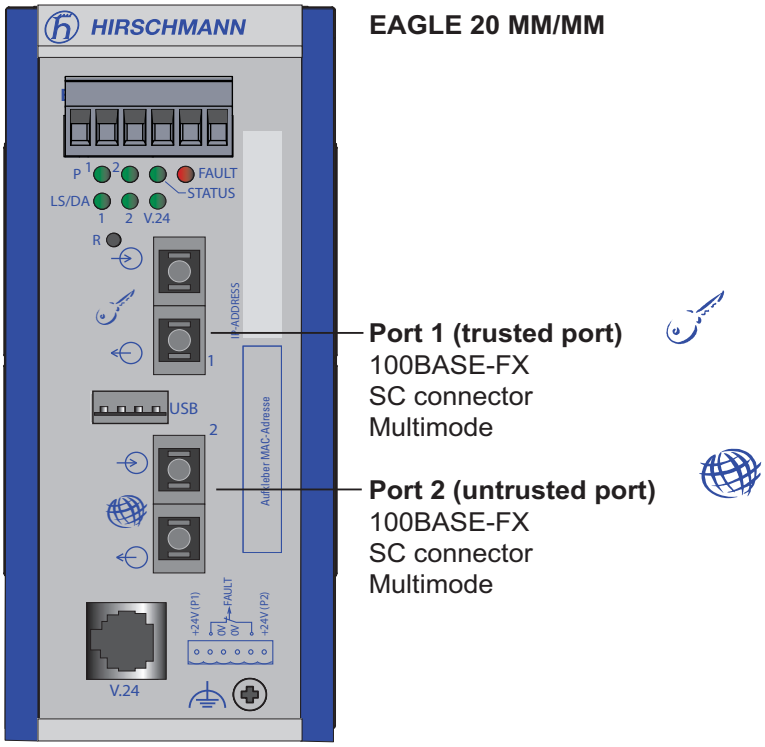


Figure 5: Interfaces of the EAGLE 20 MM/MM

2 Assembly and start-up

The devices have been developed for practical application in a harsh industrial environment. The installation process is correspondingly simple.

On delivery, the device is ready for operation.
The following procedure has been proven to be successful for the assembly of the device:

- Unpacking and checking
- Connect the terminal block for voltage supply and signal contact and connect the supply voltage
- Install the terminal block, start-up procedure
- Install the device on the hat-rail hub, grounding
- Install the data lines

2.1 Installing the device

Before installing and starting up the device, note the safety instructions (see page 4).

2.1.1 Unpacking and checking

☐ Check whether the contents of the package are complete (see page 27 "Scope of delivery").
☐ Check the individual parts for transport damage.

2.1.2 Terminal block for supply voltage and signal contact

The supply voltage and the signal contact are connected via a 6-pin terminal block with a snap lock.

Supply voltage

The supply voltage can be connected redundantly. Both inputs are uncoupled. There is no distributed load. With redundant supply, the power supply unit supplies the Switch alone with the higher output voltage. The supply voltage is electrically isolated from the housing.

You can choose between DC or AC voltage when connecting the supply voltage. You use the +24V and 0V pins to connect the AC voltage ((see fig. 6), (see fig. 7)).

Note: With non-redundant supply of the mains voltage, the device reports a power failure. You can prevent this message by applying the supply voltage via both inputs, or by changing the configuration in the Management.

Warning
The devices are designed for operation with a safety extra-low voltage.Thus, they may only be connected to the supply voltage connections and to the signal contact with SELV circuits with the voltage restrictions in accordance with IEC/EN 60950-1.The supply voltage is electrically isolated from the housing.

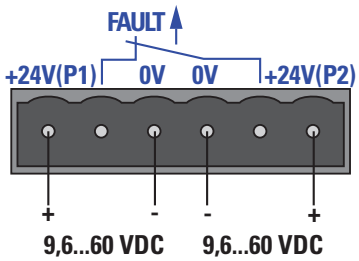


Figure 6: Pin assignment of the 6-pin terminal block, DC connection

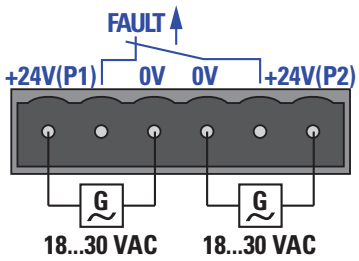


Figure 7: Pin assignment of the 6-pin terminal block, AC connection

Signal contacts

- The signal contacts are used for the remote monitoring of the device to enable remote diagnostics. You can specify the type of function monitoring in the Management.
- You can also use the Management to set the signal contact manually and thus control external devices.

A break in contact is used to report the following conditions via the potential-free signal contact (relay contact, closed circuit):

- The failure of at least one of the two voltage supplies (voltage supply 1 or 2 is below the threshold value).
- A continuous malfunction in the device (internal supply voltage).

- The defective link status of at least one port. The report of the link status can be masked by the Management for each port. In the delivery state, link status monitoring is deactivated.
- The temperature threshold has been exceeded or has not been reached.
- The removal of the ACA.

2.1.3 Connecting the terminal block, start-up procedure

☐ Pull the terminal block off the device and connect the voltage supply lines and the signal lines.

Startup procedure

☐ Mount the terminal block for the voltage supply and signal contact on the front of the device using the snap lock. Make sure that the snap lock snaps into place.

By connecting the voltage supply via the terminal block, you start the operation of the device.

2.1.4 Installing the device on the hat-rail hub, grounding

☐ Mount the device on a 35 mm hat rail in accordance with DIN EN 60175.
☐ Attach the upper snap-in guide of the device into the hat rail and press it down against the hat rail until it snaps into place.

Note: The shielding ground of the industrial connectable twisted pair lines is connected to the lower panel as a conductor.

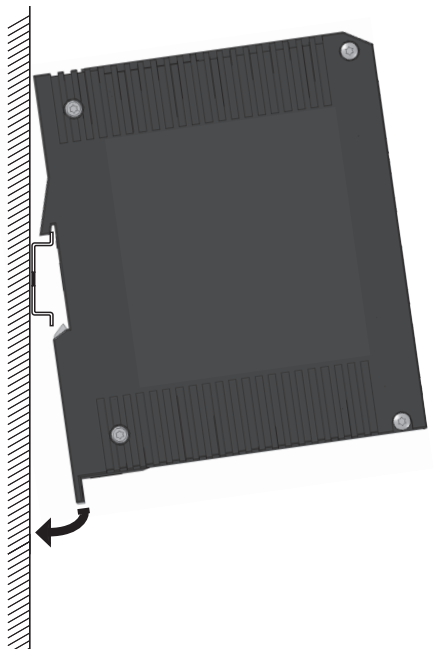


Figure 8: Mounting on the hat rails

Grounding

The lower panel of the device housing is grounded by means of the hat rail and optionally by means of the separate ground screw (see page 10 "Overview of interfaces, display and operating elements on the EAGLE 20").

2.1.5 Installing the data lines

10/100 Mbit/s twisted pair connection

10/100 Mbit/s ports (RJ45 sockets) enable the connection of terminal devices or independent network segments according to the IEEE 802.3 100BASE-TX / 10BASE-T standard.
These ports support:

- Autonegotiation
- Autopolarity
- Autocrossing (if autonegotiation is activated)
- 100 Mbit/s half duplex, 100 Mbit/s full duplex,
- 10 Mbit/s half duplex, 10 Mbit/s full duplex.

State on delivery: autonegotiation activated

The socket housing is electrically connected to the bottom panel.

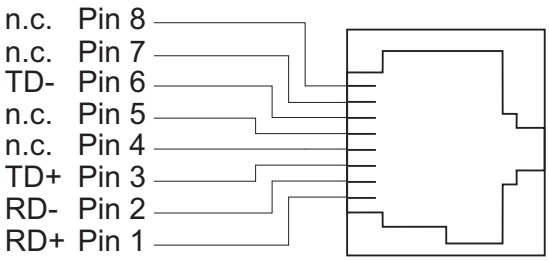


Figure 9: Pin assignment of a TP/TX interface in MDI-X mode, RJ45 socket

100 Mbit/s-LWL connection

100 MBit/s LWL ports (DSC) enable the connection of terminal devices or independent network segments in compliance with the IEEE 802.3 100BASE-FX standard. These ports support:

- Full or half duplex mode

State on delivery: full duplex

Note: Make sure that the SM ports are only connected with SM ports, and MM ports only with MM ports.

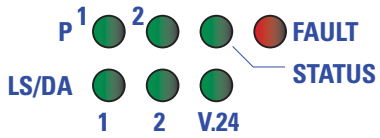
2.1.6 Connection to the network

☐ Connect the device to the local network or the local computer that you want to protect ( ).

☐ Connect the socket for the connection to the external (non-secure) network ( ), e.g. the Internet. (This network is used to set up the connections to the remote device or the remote network.)

2.2 Display elements

After the operating voltage is set up, the software starts and initializes itself. Afterwards, the device performs a self-test. During these actions, the STATUS LED flashes. The process takes around 60 seconds.



Device state

These LEDs provide information about conditions which affect the operation of the whole device.

P1 - Power 1 (green LED)	
Glowing green	Supply voltage 1 is present.
Not glowing	Supply voltage 1 is less than 18 V.
P2 - Power 2 (green LED)	
Glowing green	Supply voltage 2 is present.
Not glowing	Supply voltage 2 is less than 18 V.
FAULT - error, signal contact (red LED)	
Glowing red	The signal contact is open, i.e. it is reporting an error.
Not glowing	The signal contact is closed, i.e. it is not reporting an error.
STATUS (green/yellow LED)	
Flashing green	Initialization phase of the device.
Glowing green	Device is ready for operation.
Slowly flashing yellow	The device is in Router Redundancy Backup Mode.
STATUS and V.24 - saving processes of the AutoConfiguration Adapter (ACA)	
Flashing alternately	Error during saving process.
LEDs flash synchronously, two times a second	Loading configuration from the ACA.
LEDs flash synchronously, once a second	Saving the configuration in the ACA.

If the manual adjustment is active on the signal contact, then the error display is independent of the setting of the signal contact.

Port status

These LEDs display port-related information.

LS/DA, V.24 - data, link status (green/yellow LEDs)	Meaning
Not glowing	No valid connection.
Glowing green	Valid connection.
Flashing green (3 times a period)	Port is switched off.
Flashing yellow	Data reception.

2.3 Controls

The EAGLE 20 has a Reset button (see page 10 "Overview of interfaces, display and operating elements on the EAGLE 20").

Reset button R (restart)

The reset button is used to restart the device.

☐ To perform the restart, press the reset button for longer than 1.5 seconds until the STATUS LED goes out and the FAULT LED lights up red.

Note: The system monitor is used to flash the software. You will find a more detailed description of how to perform this action in the “Configuration” user manual of the EAGLE 20.

2.4 Making basic settings

The IP parameters must be entered when the device is installed for the first time. The device provides multiple options for configuring IP addresses:

- Entry via V.24 connection
- Entry via the HiDiscovery protocol (via the internal port)
- Auto Configuration Adapter

Further information on the basic settings of the device can be found in the "Basic Configuration" user manual on the CD ROM.

State on delivery

- IP address: DHCP default setting off
- Management password:
  user, password: public (read only)
  admin, password: private (read and write)
- V.24 data rate: 9,600 Baud
- Ethernet ports: link status is not evaluated (signal contact)
- Optical 100 Mbit/s ports: 100 Mbit/s full duplex
  All other ports: autonegotiation

USB interface

The USB socket has an interface for the local connection of an AutoConfiguration Adapter ACA 21-USB. It is used for saving/loading the configuration and for loading the software.

Contact number	Signal name
1	VCC
2	- Data
3	+ Data
4	Ground

V.24 interface (external management)

A serial interface is provided on the RJ11 socket (V.24 interface) for the local connection of an external management station (VT100 terminal or PC with corresponding terminal emulation). This enables you to set up a connection to the Command Line Interface (CLI) and to the system monitor.

VT 100 terminal settings	
Speed	9,600 Baud
Data	8 bit
Stopbit	1 bit
Handshake	off
Parity	none

The socket housing is electrically connected to the front panel of the device. The V.24 interface is not electrically isolated from the supply voltage.

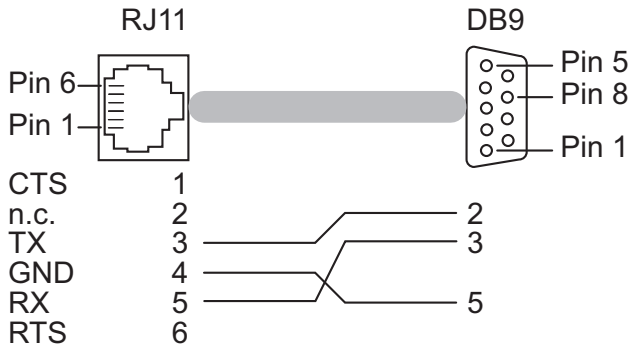


Figure 10: Pin assignment of the V.24 interface

Note: You will find the order number for the terminal cable, which is ordered separately, in the Technical Data chapter (see on page 25 "Technical data").

2.5 Configuration

2.5.1 Firewall and VPN functions

Firewall functions

The EAGLE 20 supports the following firewall functions:

- Stateful Inspection Firewall
- Transparent Firewall
- Configurable Firewall rules:
  - Incoming/outgoing data traffic
  - Modem access
  - External Management access
- IP Masquerading, 1-to-1 NAT, port forwarding
- IP Spoofing Protection

VPN functions

The EAGLE 20 supports the following Virtual Private Network (VPN) functions:

- Multipoint VPN: Router Mode
- VPN protocols: IPsec
- Encryption algorithms:

- DES-56
- 3DES-168
- AES-128, AES-192, AES-256

- Authentication:
  - Pre-shared key (PSK)
  - X.509v3 certificates
- Hashing algorithms: MD5, SHA-1
- NAT-T support

2.5.2 Operating modes

This device protects the network to be secured (secure port) from external influences (non-secure port). These influences can include deliberate attacks or unauthorized access attempts, as well as interfering network events such as overloads.

State on delivery

On delivery, the device works in the Transparent Mode. In this mode, no network settings (e.g., for subnetworks) are required for operation.

The firewall has been preconfigured so that all IP traffic from the secure network () is possible; however, traffic from the non-secure network () to the secure one is not possible. Thus, already in the delivery state, external attacks on the secure network are not possible.

Transparent Mode

The Transparent Mode is a transparent bridge mode. In this mode, the device works as a 2-port bridge, whereby only IP and ARP frames corresponding to the firewall rules are transmitted.

In the state on delivery, you can access the device via address 192.168.1.1/24 without configuring the IP address.

Router Mode

In Router Mode, the device works as a 2-port router. You will find a detailed description of the IP configuration in the “Basic Configuration” user manual of the EAGLE 20.

Note: In the Router and Transparent modes, an additional network access option to the secure network is provided over the V.24 interface of the EAGLE 20, via PPP. In this case, communication is possible with the EAGLE 20 itself or with the devices in the secure network (according to the firewall rules for the modem connection).

PPPoE Mode

In PPPoE Mode, the EAGLE 20 works like in the router mode, with the difference that the PPPoE protocol is used at the external port. This enables Internet connections via a DSL modem, for example.

2.5.3 Start configuration

To access the EAGLE 20, you proceed as follows (device in state on delivery):

☐ Make sure that the required Java plug-in is installed on your computer. You will find information about the plug-in and its installation in the Configuration user manual.

☐ Start an https-capable Web browser on the computer connected to the secure port (e.g. Mozilla Firefox from version 1 on, or Microsoft Internet Explorer from version 6 on) in order to configure the EAGLE 20.

☐ Connect the non-secure port to your network.

☐ Enter the following address in the Web browser:
https://192.168.1.1/

Result: The HTTPS connection to the EAGLE 20 is set up. A security warning is displayed.

☐ Confirm the security warning with “Yes”.

☐ To login, enter:
– Login: admin
– Password: private
(case-sensitive!)

Result: The Administrator website of the EAGLE 20 is displayed.

☐ Configure the device in accordance with the Configuration user manual.

Alternatively, you can perform the IP configuration for the Transparent Mode using the HiDiscovery protocol. You will find the HiDiscovery software in the CD ROM included in the delivery.

Note: If the configuration connection to the EAGLE 20 is not set up, you will find detailed information in the “Configuration User Manual - Industrial ETHERNET Firewall EAGLE 20”.

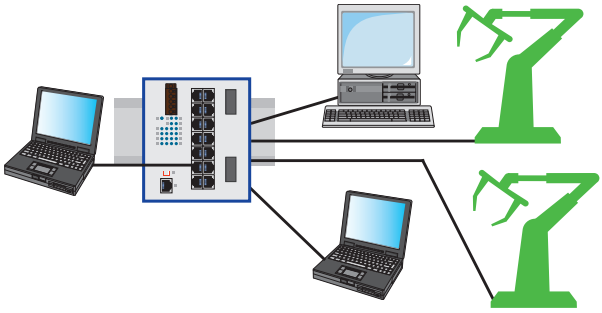


Figure 11: Configuration before the installation of the EAGLE 20

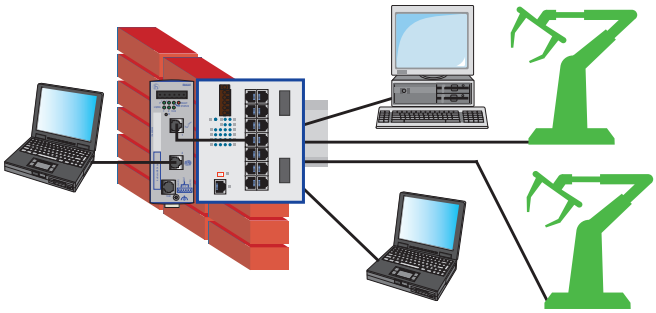


Figure 12: Configuration after the installation of the EAGLE 20

2.6 Disassembly

Disassembling the device

☐ In order to remove the device from the hat rail, move the screwdriver horizontally under the chassis in the locking gate, pull this down - without tilting the screwdriver - and fold the device up.

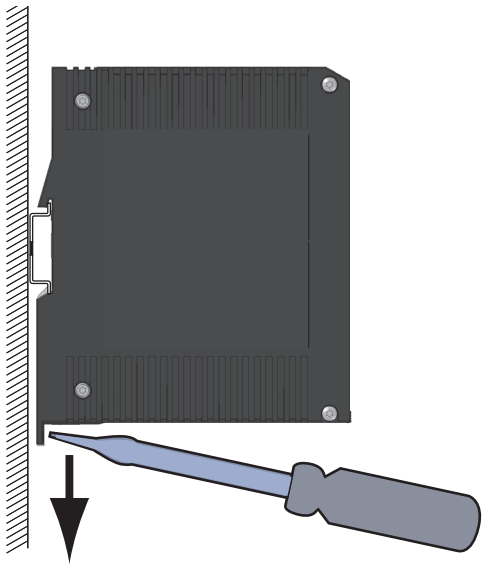


Figure 13: Disassembly

3 Technical data

General technical data

Dimensions W x H x D	EAGLE 20...	46 mm x 131 mm x 111 mm
Weight	EAGLE 20...	340 g

Power supply	Operating voltage	18 to 60 V DC Safety extra-low voltage (SELV/PELV) redundant inputs disconnected. Relevant for North America: Nec Class 2 power source max. 5A.
Overload current protection at input		Non-replaceable fuse
Insulation voltage between operating voltage connections and housing		800 V DC Protective elements limit the insulation voltage to: 90 V DC (1 mA).
Signal contact		max. 1 A, 60 V DC or 30 V AC
Environment	Storage temperature (ambient air temperature) Humidity Atmospheric pressure	-40 °C to +70 °C 10% to 95% (non-condensing) Up to 2000 m (795 hPa), higher altitudes on request
Operating temperature	Ambient air	0 °C to +60 °C
Contamination level		2
Protection classes	Laser protection Protection class	Class 1 according to EN 60825-1 (2001) IP 20

EMC and immunity

EMC interference immunity		
EN 61000-4-2	Electrostatic discharge Contact discharge Air discharge	 4 kV 8 KV
EN 61000-4-3	Electromagnetic field 80 - 2,700 MHz	 10 V/m
EN 61000-4-4	Fast transients (burst) - Power line - Data line	 2 kV 1 kV
EN 61000-4-5	Voltage surges - Power line, line/line - Power line, line/earth - Data line	 0.5 kV 1 kV 1 kV
EN 61000-4-6	Line-conducted interference voltages 150 kHz - 80 MHz	 10 V
EN 61000-4-9	Impulse-shaped magnetic fields	-

EMC emitted interference		
EN 55022	Class A	Yes
FCC 47 CFR Part 15	Class A	Yes
Germanischer Lloyd	Classification and Construction Guidelines VI-7-3 Part 1	-
Stability		
Vibration	IEC 60068-2-6 Test FC test level according to IEC 61131-2	Yes
	Germanischer Lloyd Guidelines for the Performance of Type Tests Part 1	-
	IEC 870-2-2 table 3 normal, requirements according to EN61850-3	-
	EN 61373, Category 1, Class A (broadband noise), requirements according to EN 50155	-
Shock	IEC 60068-2-27 Test Ea test level according to IEC 61131-2	Yes
	IEC 870-2-2 table 3 normal, requirements according to EN61850-3	-
	EN 61373, Category 1, Class A requirements according to EN 50155	-

Network range

TP port	
Length of a twisted pair segment	max. 100 m

Table 1: TP port 10BASE-T / 100BASE-TX

LWL Port	Wavelength	Fiber	System attenuation	Expansion	Fiber data
MM	1300 nm	50/125 µm	0-8 dB	0-5 km	1.0 dB/km, 800 MHz*km
MM	1300 nm	62.5/125 µm	0-11 dB	0-4 km	1.0 dB/km, 500 MHz*km
SM	1300 nm	9/125 µm	0-16 dB	0-30 km	0.4 dB/km; 3.5 ps/(nm*km)

Table 2: LWL port 100BASE-FX

MM = multimode
SM = singlemode

Power consumption/power output

Device	Power consumption at 24 V DC	Power output at 24 V DC	Power consumption at 24 V AC	Power output at 24 V AC
EAGLE 20 with 2 TX ports	6.9 W	23.5 Btu (IT)/h	7.2 W	24.6 Btu (IT)/h
EAGLE 20 with 1 TX port and 1 FX port	8.1 W	27.6 Btu (IT)/h	8.1 W	27.6 Btu (IT)/h
EAGLE 20 with 2 FX ports	9.5 W	32.4 Btu (IT)/h	9.6 W	32.8 Btu (IT)/h

Order numbers

Device	Order number
EAGLE 20 TX/TX	943 987-001
EAGLE 20 TX/MM	943 987-002
EAGLE 20 TX/SM	943 987-003
EAGLE 20 MM/TX	943 987-004
EAGLE 20 MM/MM	943 987-005

Interfaces

EAGLE 20...	V.24 port: external management, modem terminal block, 6-pin: signal contact, max. 1 A, 24 V and voltage supply USB interface: ACA 21-USB
Additionally 2 type-dependent ports each	Up to two 10/100 Mbit/s twisted pair (TP/TX) ports with RJ45 sockets and/or up to two 100 Mbit/s FX ports (multimode or singlemode) with DSC connections

Scope of delivery

Device	Scope of delivery
EAGLE 20...	EAGLE 20... device Terminal block for supply voltage and signal contact (6-pin) CD ROM with user manual Installation user manual

Accessories

Note: Please note that products recommended as accessories may have characteristics that do not fully correspond to those of the corresponding product. This may limit their possible usage in the overall system.

Name	Order number
Pocket Guide	280 710-851
AutoConfiguration Adapter ACA 21-USB	943 271-001
Terminal cable	943 301-001
6-pin terminal block	943 845-002
Rail Power Supply RPS 30	943 662-003
Rail Power Supply RPS 80 EEC	943 662-080
Rail Power Supply RPS 120 EEC	943 662-120
Industrial HiVision Network Management software	943 156-xxx

Underlying norms and standards

Name	
EN 61000-6-2:2005	Generic norm – immunity in industrial environments
EN 55022:2006	IT equipment – radio interference characteristics
IEC/EN 60950-1:2006	Safety for the installation of IT equipment
EN 61131-2:2003	Programmable logic controllers
EN 50121-4:2000	Railway applications - EMC - emitted interference and interference immunity for signal and telecommunication systems
FCC 47 CFR Part 15:2006	Code of Federal Regulations
German Lloyd	Classification and Construction Guidelines VI-7-3 Part 1 Ed.2003
cUL 508:1998	Safety for Industrial Control Equipment
EN 60079-15	Electrical equipment for explosive gas atmospheres – part 15: Construction, testing and marking of protection type "n" electrical apparatus.
EN 50155	Declaration (Railway)
IEC/EN 61850-3	Communications networks and systems in stations
IEEE 1613	Standard Environment and Testing Requirements for Communication Networking Devices in Electric Power Substations

Table 3: List of norms and standards. Certified devices are marked with a certification indicator.

IEEE 802.1 AB	Topology Discovery (LLDP)
IEEE 802.1 D	Switching, GARP, GMRP, Spanning Tree (Supported via 802.1S implementation)
IEEE 802.1 D-1998	Media access control (MAC) bridges (includes IEEE 802.1p Priority and Dynamic Multicast Filtering, GARP, GMRP)
IEEE 802.3 - 2002	Ethernet
IEEE 802.3 ac	VLAN Tagging

Certifications

The following table shows the status of the certification of the product family.

Standard	
cUL 508 / CSA C22.2 No.142	Yes
Germanischer Lloyd	Yes

Table 4: Certifications - for the current status, visit www.hirschmann.com

A Further support

Technical questions and training courses

In the event of technical queries, please talk to the Hirschmann contract partner responsible for looking after your account or directly to the Hirschmann office.
You can find the addresses of our contract partners on the Internet: www.hirschmann.com.

Our support line is also at your disposal:

- Tel. +49 1805 14-1538
- Fax +49 7127 14-1551

Answers to Frequently Asked Questions can be found on the Hirschmann internet site (www.hirschmann.com) at the end oft the product sites in the FAQ category.
The current training courses to technology and products can be found under http://www.hicomcenter.com.

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- Training offers you an introduction to the basics, product briefing and user training with certification.
- Support ranges from the first installation through the standby service to maintenance concepts.

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